DOCUMENT RESUME

ED 342 933 CE 060 479

AUTHOR Martin, Larry G.
TITLE Assessment of the 1987 Changes in GED Score Requirements in Wisconsin. Final Report.
INSTITUTION Wisconsin Univ., Milwaukee.
SPONS AGENCY Wisconsin State Board of Vocational, Technical, and Adult Education, Madison.
PUB DATE Jan 92
NOTE 60p.
PUB TYPE Reports - Research/Technical (143) -- Tests/Evaluation Instruments (160)

EDRS PRICE MF01/PC03 Plus Postage.
DESCRIPTORS Adult Basic Education; Employment Level; *High School Equivalency Programs; *State Standards; *Testing Problems; Testing Programs; *Test Norms; Test Results; *Test Score Decline; Test Use
IDENTIFIERS *General Educational Development Tests; *Wisconsin

ABSTRACT

In 1987, General Educational Development (GED) test passing score requirements were raised in Wisconsin. To study the effect, data were gathered from samples of 480 examinees each for 1986 and 1989 through site visits and follow-up surveys mailed to 900 of the 960 in the samples. Responses were received from 206 persons (37 percent). Chi-square and t-tests were used to analyze the data, yielding such findings as the following: (1) no effects on the demographic and academic composition of examinees were found; (2) the 1989 examinees significantly increased their academic preparation efforts; (3) significantly higher percentages of 1989 examinees failed to obtain minimum and average scores required for passing; (4) 1989 examinees were significantly more likely to enroll in further education or training programs; (5) 1989 examinees had significantly lower incomes and were more likely to be unemployed than 1986 examinees, but 1989 examinees who passed the GED tests were significantly more likely to be employed than those who failed; (6) with each increase in the minimum score requirement, there were correspondingly greater increases in the variances between the lowest and highest scores on the five tests but only small increases for the norming sample. The study recommended keeping the new higher minimum score requirement but lowering the five-test average score for passing; further study of the GED tests was suggested. (The survey instrument with cover letter is appended.) (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

FINAL REPORT

Assessment of the 1987 Changes in GED Score Requirements in Wisconsin

by

Larry G. Martin, Ph.D.

Prepared for the Wisconsin Board of Vocational Technical and Adult Education

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

L Martin

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

January, 1993

University of Wisconsin-Milwaukee
Department of Administrative Leadership
P.O. Box 413
Milwaukee, WI 53201
(414) 229-5734

BEST COPY AVAILABLE

Table of Contents

EXECUTIVE SUMMARY 2

INTRODUCTION 5

Reasons for the New Score Requirements 6
The Basis of the New Score Requirements 6

STATEMENT OF THE PROBLEM 7

RESEARCH QUESTIONS 9

BACKGROUND TO THE PROBLEM 10

Characteristics of GED Examinees 11
Validity of the GED 11
Content Knowledge and Skills Measured by the GED Tests 12

METHODOLOGY 13

Sampling Process 14
Limitations of the Study 16
Instrumentation 16

ANALYSIS OF DATA 17

Examinees' Entering Characteristics 17
Examinees' Reactions 21
Examinees' Test Performance 24
Test Performance of Noncompleters 30
Personal Benefits of the GED Credential 33
Societal Impact of Possessing the GED 34
Differential Rates of Passing With Changing Score Requirements 35
Differential Rates of Passing Given Minimum Scores 36

DISCUSSION 41

CONCLUSIONS AND RECOMMENDATIONS 44

APPENDIX I - Survey Instrument

BEST COPY AVAILABLE

Executive Summary

I. Problem Statement

A. In 1987 the DPI increased the score requirements for obtaining a GED diploma. The new standards require examinees to obtain a minimum score of 40 on any single test and an average of 50 for all tests--for a total score of 250 on all tests.

B. Since the new score requirements were implemented, there has been a sharp decrease in the numbers of GED credentials issued in Wisconsin, e.g., there was a 68.6 percent decrease between 1987 and 1989.

C. There are considerable disagreements among DPI administrators, adult literacy administrators, and adult literacy practitioners about the need for and effects of the new score requirements.

II. Research Questions

A. To what extent did the new GED requirements in Wisconsin effect the demographic and academic characteristics of the examinees in 1989 who took the tests?

B. To what extent did the new GED score requirements in Wisconsin effect the 1989 examinees' perceptions toward preparatory programs and the methods they used to prepare for the tests?

C. To what extent did the new GED score requirements in Wisconsin effect the number of examinees in 1989 who obtained a passing or failing score?

D. To what extent did the new GED score requirements effect the number of examinees who failed to complete all five tests in 1989?

E. To what extent did the new GED score requirements effect the degree to which those who passed the GED tests in 1989 perceived it as being personally beneficial, e.g., helpful in attaining educationally related goals, and to obtain either education or training?

F. To what extent has either passing or failing the GED tests had an effect on the ability of 1989 examinees to acquire employment, increase personal income, or change the source of personal income?

G. What would be the differential rates of passing for the 1986 and 1989 GED examinees and the 1987 Norming Sample given the different formulas currently being utilized by different states to establish score requirements?

H. What would be the differential rates of passing for the 1986 and 1989 GED examinees and the 1987 Norming Sample given the four Minimum Scores currently recognized by the American Council on Education?

III. Findings and Conclusion

A. **No Effects on the Demographic and Academic Composition of Examinees**--there were no relevant significant changes in the demographic and academic characteristics of the examinees from 1986 to 1989.

B. **Increased Academic Preparation and Performance**--the 1989 examinees significantly increased their academic preparation efforts in order to attain higher minimum and average scores. These efforts apparently resulted in the statistically significant increases in academic performances observed for 1989 examinees compared to those in 1986.

C. **Increased Academic Failure**--significantly higher percentages of 1989 examinees failed to obtain minimum and average scores required for passing, even after one or more retests.

D. **A Disincentive to Complete the Tests**--Analysis of t-test comparisons to test scores for 1986 and 1989 noncompleters, and comparisons of noncompleters from both years to their counterparts who completed all five tests suggest that 1989 noncompleters may have discontinued their examinations for "academic" reasons.

E. **Increased Participation in Postsecondary Education or Training**--1989 examinees were significantly more likely to enroll in educational or training programs and to indicate the GED was helpful for this purpose.

F. **Reduced Economic Benefits**--1989 examinees earned significantly lower incomes and were significantly more likely to be unemployed than 1986 examinees. However, those 1989 examinees who passed the GED tests were significantly more likely than those who failed to be employed either full or part-time.

G. **Increased Score Differentiation With increases in Minimum Scores**--with each increase in the minimum score requirement, there were correspondingly greater increases in the variances between the lowest and highest scores on the five tests among the GED examinees, but only small increases for the Norming Sample.

III. Recommendations

A. The score requirement should be changed from a "minimum of 40 and an average of 50" to a minimum of 40 and an average of 45. This requirement would maintain the higher minimum scores of the present requirements, thereby demanding higher knowledge of examinees on all tests. However, it would lower the required average scores thereby permitting greater access to the GED.

B. The results of the 1987 Norming Study should be disregarded as invalid and a new more representative study should be conducted.

C. The administrators of GED test storage sites should adopt a common (uniform) set of data collection, storage and retrieval procedures.

D. The process used to establish score requirements for the GED tests should be evaluated.

E. Further research should be conducted to address other significant questions and issues raised by this study.

FINAL REPORT

Assessment of the 1987 Changes in GED Score Requirements in Wisconsin

INTRODUCTION

Prior to 1987, the state of Wisconsin required examinees seeking a General Education Development (GED) diploma to obtain a minimum score of 35 on any single test and a average of at least 45 for all five tests (for a total score of 225 on all tests). In 1987, the rule under which the Wisconsin Department of Public Instruction (DPI) issued the high school equivalency diplomas was changed. One element of the new rule (PI5, Wis. Admin. Code) increased the age requirement for GED examinees to 18.6 years of age. Another element authorized the DPI to issue two kinds of credentials: a certificate of General Educational Development (GED) and a high school equivalency diploma (HSED).

A certificate of GED indicates that an individual has completed a major part of the work required to earn a high school equivalency diploma, but not all of it. A HSED challenges the examinee to meet several other requirements and is considered by the DPI to be the best substitute for a regular high school diploma. It requires examinees to: 1) meet new score requirements; 2) either complete 0.5 high school credits, successfully complete an approved course, or receive a passing score on a DPI approved test in health; 3) either successfully complete a course, obtain 3 high school credits, or receive a passing score on a DPI approved test in citizenship; 4) provide written verification of the attainment of employability skills; and 5) provide written verification of instruction in career awareness.

The new score requirements, which were phased in during the 1988 calendar year are applicable to both types of certifications. They require examinees to obtain a minimum score of 40 on any single test **and** an average of at least 50 for all tests--for a total score of 250 on all tests (DPI Bulletin No. 9017, 1988). The new Wisconsin completion standards are the highest in the nation. While the minimum requirements are set nationally so that 25 percent of graduating high school seniors could not pass the tests, Wisconsin's standards are such that 51 percent of high school seniors nationally could not meet the requirements (1989 GED Statistical Report), while 34.4 percent of Wisconsin's seniors, and 58 percent of the state's African American seniors would fail the requirements (The Wis. Norming Study, 1988).

BEST COPY AVAILABLE

Reasons for the New Score Requirements

The State Superintendent cited several reasons for changing the score requirements. First, he identified two statutory provisions which indicated a need for changes: [s. 115.29(4)], Wis. Stats., indicates that the alternative diploma the Superintendent is empowered to award is to be "equivalent" to a high school diploma; and the educational standards enacted by the legislature in 1988 added several requirements for high school graduation, e.g., instruction in health, civics, and job-seeking and retention skills (WLAB Report, 1991).

Second, several circumstances were cited which prompted the change: a) a concern that some high school students were dropping out of school believing they could quickly and easily obtain a GED diploma without having to complete regular school class work, b) results of a 1986 UW-Milwaukee Employment and Training Institute survey of employers' attitudes concerning GED diplomas that indicated employers did not find the GED diploma credible as a substitute for a high school diploma when making hiring decisions, and c) data from the UW-Milwaukee study which indicated that GED recipients who enrolled in college had higher dropout rates and lower grade point averages than high school graduates (WLAB Report, 1991).

The Basis of the New Score Requirements

The new score requirements were based on a 1987 norming study that was conducted statewide. The study sampled 50 schools and included a total of 1,112 students who took one or more tests. Complete data was available for 913 students. However, both the male/female proportions (45/55%) and the black/white proportions (2/95%) of the students were sufficiently different from state proportions (50/50 and 8/87% respectively) that the sample could not be considered to be truly representative of Wisconsin seniors (Wisconsin Norming Study, 1988). The study also noted that the nineteen black students who took all five tests averaged approximately 7.0 scale score points lower than the white students. However, DPI officials argued that due to the nonparticipation of key schools with high concentrations of black students the students in the sample known to be black were most likely not representative of black Wisconsin high school seniors. Therefore, they recommended against weighing the scores of black students in the sample, arguing that it would only introduce another unknown bias into the sample data. Additionally, they argued that there is no need to adjust the scores to compensate for the overrepresentation of females in the study because the difference between the average scores for males and females was negligible (males averaged 52.5 and females averaged 52.9).

These unadjusted summary data were interpreted by the State Superintendent to indicate that Wisconsin students scored significantly higher than a national sample of graduating seniors and that the minimum passing standards in Wisconsin needed adjustments (The Wis. Norming Study, 1988). He said, "the new rules are intended to encourage students to remain in school while providing adults with several options to earn an equivalency diploma that more appropriately reflects the requirements of the state's high school graduation standards and education for employment initiative" (The Wis. Norming Study, 1988).

STATEMENT OF THE PROBLEM

The GED program is the largest and most successful dropout recovery program in Wisconsin. Over an eighteen year period, from 1971 to 1989, 125,717 GED credentials were issued in the state (The GED Statistical Report, 1989). During the three years (1984 through 1986) prior to the 1987 changes in rules and score requirements, an average of 8,137 credentials were issued in the state (The GED Statistical Report, 1986). During the two years following the implementation of the rule changes and new score requirements, the number of credentials awarded in the state dropped from 4,603 credentials issued in 1988 to 2,660 issued in 1989. Although nationally a more rigorous GED test was also phased in during this time period, the 42 percent decrease compares to a national decrease of 13.4 percent and an increase in our neighboring state of Illinois of 9.9 percent. Also, comparing the number of GED credentials earned in 1989 to those earned in 1987 (the last full year that allowed GED completion under Wisconsin's old standards), the number of GED completions dropped from 8,468 to 2,660; a 68.6 percent decrease. During this same period, the national decrease was 20.4 percent and the decrease for the neighboring state of Illinois was 0.7 percent (The 1989 GED Statistical Report).

The sharp decrease in GED diplomas prompted an investigation by the Wisconsin Legislative Audit Bureau. The WLAB conducted extensive interviews with personnel who have local, state, and national affiliation with the GED. In its report, the WLAB (1991) found logical inconsistencies in DPI's arguments supporting the higher standards, and considerable disenchantment with and concern about the effects of the increased score requirements among Wisconsin program administrators and practitioners. WLAB (1991) found that opponents of the increased score requirements discount the circumstances cited as prompting the additional requirements. They argued that the goals of the individuals seeking alternative diplomas should be considered. Since many GED program participants are interested in improving their employment

BEST COPY AVAILABLE

opportunities or in achieving the self-esteem which results from completing the diploma, they argued that no barriers beyond those which are absolutely necessary to maintain credibility should be established.

The WLAB, (1991) report also made several other observations. First, no studies verified the assumption that the availability of the GED diploma was influencing dropouts. This concern seems to contradict a new rule, implemented in July 1991, which allows students who are 17 years old and are at risk of dropping out or failing in school to participate in GED programs provided they are enrolled in high school. Second, the report indicated that adult literacy practitioners were not convinced that data cited by DPI constitute a problem, particularly since the UW-Milwaukee study also reported a majority of employers surveyed, 52 percent, considered the high school diploma and the GED diploma equal. Also, 78 percent of the employers considered the GED diploma as acceptable as a high school diploma. Third, the 1986 UW-Milwaukee study presented conflicting evidence of the ability of GED graduates to succeed in college. Practitioners argued that GED graduates who drop out of college may do so primarily because of family or financial difficulties, and that it is inappropriate to use college performance as evidence of a need for more rigorous standards since only 2 percent of GED graduates in Wisconsin enroll in four-year colleges. Fourth, although the UW-Milwaukee study concluded that GED graduates enrolled in the Milwaukee Area Technical College had attrition rates similar to those of high school dropouts, the WLAB report points out that none of eight GED graduates in the highest score range of 350 to 400 graduated from MATC. Therefore it suggested that achieving a higher passing score did not significantly increase the likelihood that a GED graduate would complete a MATC program. Fifth, opponents challenge the validity of the 1987 norming sample as being truly representative of graduating high school seniors in Wisconsin. They point out the significant underrepresentation of minorities in the sample and argue that a more representative sample might justify a lower standard.

In summary, the Superintendent and other proponents of the increased score requirements are concerned that there is a need to ensure the awarding of a high school equivalency diploma reflects substantive educational achievement. Therefore, they argue that candidates for the diploma must meet standards that are consistent with other efforts to improve the quality of education by raising educational standards, e.g., raising high school graduation requirements and university admission standards. However, there are considerable disagreements about the significance of the research which DPI cites in support of higher standards. Practitioners have also raised questions about the method DPI used to set the higher score.

They have argued that the higher score places too great an emphasis on the GED diploma as an equivalent credential to the high school diploma without adequate consideration of its role in providing access to increased employment and advanced educational opportunities. Although the WLAB (1991) report made recommendations to the DPI regarding the implementation of the new GED program requirements, it did not speak to the causal effects of the changes in score requirements.

RESEARCH QUESTIONS

The purpose of this research is to investigate the differential effects of the changes in the 1987 GED score requirements on the number of examinees completing and passing the revised GED tests in Wisconsin. The changes in score requirements could have triggered several reactions among those seeking the GED, such as changes in: the characteristics of examinees taking the tests, examinees' reactions to and perceptions toward their preparatory programs, GED test performance, perceptions of personal benefits from possessing the GED, and socioeconomic status. Therefore this study sought to address the following research questions:

1. **To what extent did the new GED score requirements in Wisconsin effect the demographic and academic characteristics of the examinees in 1989 who took the tests?**
2. **To what extent did the new GED score requirements in Wisconsin effect the 1989 examinees' perceptions toward preparatory programs and the methods they used to prepare for the tests?**
3. **To what extent did the new GED score requirements in Wisconsin effect the number of examinees in 1989 who obtained a passing or failing score?**
4. **To what extent did the new GED score requirements effect the number of examinees who failed to complete all five tests in 1989?**
5. **To what extent did the new GED score requirements effect the degree to which those who passed the GED in 1989 perceived it as being personally beneficial, e.g., helpful in attaining educationally related goals, and to obtain either education or training?**
6. **To what extent has either passing or failing the GED tests had an effect on the ability of 1989 examinees to acquire employment, increase personal income or change the source of personal income?**
7. **What would be the differential rates of passing for the 1986 and 1989 GED examinees and the 1987 Norming Sample given the different formulas currently being utilized by different states to establish score requirements?**

BEST COPY AVAILABLE

8. **What would be the differential rates of passing for the 1986 and 1989 GED examinees and the 1987 Norming Sample given the four Minimum Scores currently recognized by the American Council on Education?**

BACKGROUND TO THE PROBLEM

Nationally, the most popular alternative among adults seeking a high school diploma is the GED. These tests are developed by the Educational Testing Service and are administered jointly by the American Council on Education (ACE) and sixty-nine state, province, and territory departments and ministries in the U.S. and Canada (Whitney, 1983). The tests were first administered in 1942 to measure the academic skills of war veterans and were considered as a "second chance" for individuals whose class had graduated from high school (Swartz, et al., 1988). Over 700,000 people are tested annually in each of five subject areas: Writing Skills, Science, Social Studies, Interpreting Literature and the Arts, and Mathematics (Whitney and others, 1985). The Tests measure the "major and lasting outcomes" associated with four years of high school study (Baldwin, 1990). A GED diploma is awarded based on attainment of a minimum score on each of the five tests. This minimum score is typically set at a level that exceeds the scores of from 25 to 51 percent of a sample of graduating high school seniors. Therefore, it is not uncommon for the standards set for GED examinees to be such that examinees must not only meet the standards established for graduating high school seniors, but they must exceed them. For example, a study of New York's high school minimum competency test showed that 37 percent of those who passed the state's reading competency test failed the GED Tests (Sonnenblick, 1980).

There is wide variation in the specific score requirements for passing the GED because each participating jurisdiction sets its own specific standard. In 1989 the ACE indicated that the 50 states in the U.S. and the District of Columbia utilized several formulas for establishing minimum score requirements: 30 states (58.8 percent) established a minimum score of 35 on each test and an average of 45 on all tests; 10 states (19.61 percent) required a minimum of 40 and an average of 45; 4 states (7.84 percent) set the scores at a minimum of 40 or an average of 45; 2 states (3.92 percent) required a minimum of 40 or an average of 50; one state (1.96 percent) requires 40 on each test, and one state requires different scores for each test. In 1988 Wisconsin became the only state to require a minimum of 40 and an average of 50. The least difficult of these requirements is the one requiring a minimum of 40 or an average of 45; 75 percent of high school seniors nationally would likely meet this requirement (1989 GED Statistical Report). The most difficult

requirements are either "minimum of 45", or "minimum of 40 and an average of 50". Only 51 percent of U.S. graduating high school seniors would likely meet these requirements.

Characteristics of GED Examinees

More than 7.5 million adults in the United States and Canada have obtained a GED diploma since 1971. Approximately 450,000 examinees earn GED credentials each year. The program accounts for more than one of every six diplomas issued in the U.S. annually (Whitney, 1989). A 1980 survey of GED test candidates found that the primary reasons for taking the tests were to obtain or maintain a job (42%), to meet admissions requirements for a college or vocational training program (30%), for personal satisfaction (25%), and because of military requirements (5%) (Malizio and Whitney, 1981). Although class attendance is not required to take the tests, 80 percent of candidates use some form of preparation and about 50 percent use classroom instruction (Cervero, 1983).

While the number of GED candidates between the ages of 18 and 24 has declined nationally by 26 percent since 1980 (Baldwin, 1990), GED examinees are still comprised of mostly young adults from a variety of ethnic backgrounds. In 1989 nearly a third of the GED candidates were 19 or younger and more than two-thirds were under 30 years of age. About 30 percent of all 1989 examinees were minorities; with 11 percent Hispanic, and 14 percent African American. More than two-thirds of the examinees completed 10th grade or higher before leaving school. Close to three-fourths of GED candidates reported maintaining a "mostly C or better" average while in school (Baldwin, 1990).

Validity of the GED

Because the GED test is normed on the performance of high school seniors, the GED Testing Service periodically revises them to reflect changes in the curricula and instructional practices in the nation's high schools. The most recent revision occurred in January 1988 when newly revised forms were administered in 37 states. Other states and Canadian provinces followed during the remainder of the year. The 1988 revisions were guided by the recommendations of national advisory committees comprised of curriculum and adult education experts from throughout the country. These committees recommended two major changes in the content and format of the GED tests: the inclusion of a writing exercise, or essay, as part of the Writing Skills Test; and greater emphasis on higher level thinking skills in the multiple-choice portions of the tests. In

BEST COPY AVAILABLE

addition, scores on the new tests reflect new norms that are based on the Spring 1987 administration of the tests to U.S. graduating high school seniors.

At least two factors support the validity of the GED Tests as a reliable and accurate measure of the abilities of adult examinees at the high school level nationwide: (1) the GED Tests are written and reviewed externally by secondary educators familiar with high school curriculum and by adult educators who are intimately familiar with adults' interests and experiences (Whitney, Malizio and Patience, 1985), and (2) the GED Tests are standard nationwide. While the educational attainment of recipients of traditional or other equivalency diplomas may vary across schools or states, due to different standards, practices, and student experiences, a GED credential in one state or region is based on the same test battery and score scale nationwide (Laurence, 1983).

Content Knowledge and Skills Measured by the GED Tests

The test questions on the GED Tests utilize a variety of formats requiring examinees to exact information from excerpts of poems, plays, journal articles, newspaper articles, novels, textbooks, pie graphs, diagrams, word problems, maps, and simple statements (Webb, 1991). Each test (except for the essay section of the writing test) consists of multiple choice questions in a number of categories:

Test 1: Writing Skills. Part 1 covers sentence structure, usage, and mechanics; Part 2 is an essay.

Test 2: Social Studies. Includes questions on history, geography, economics, political science, and behavioral science.

Test 3: Science. Includes life sciences (biology) and physical sciences (earth science, physics, and chemistry).

Test 4: Interpreting Literature and the Arts. Includes popular literature, classical literature, and commentary; and

Test 5: Mathematics. Includes arithmetic (measurement, number relationships, and data analysis) algebra, and geometry.

In addition to the above areas of content knowledge, Swartz, et al., (1988) argue that the tests are designed to test cognitive skills as described by Bloom's taxonomy of cognitive objectives: comprehension, application, analysis, synthesis, and evaluation. They suggest that the focus of the tests is not to simply regurgitate facts, but on the cognitive ability of examinees to use the most effective approach to read and

interpret a given passage or problem, locate relevant information, make inferences and solve problems based on the information provided. Given recent revisions, the tests now emphasize higher-level thinking and problem-solving skills, check for an awareness of computer technology and consumer skills, and relate questions to adult settings, roles, and work-related skills (Swartz, et al., 1988).

Additionally, the GED Testing Service (1991) observes that the test-taking process to which examinees are exposed requires mental and physical skills that may be applicable to both job and postsecondary educational situations. Some of the skills necessary for successfully completing the tests are: a) listening and reading; and b) the ability to comprehend and process procedural information, apply test-taking strategies, follow procedures, and understand and follow oral and written instructions. Examinees must also be able to concentrate on written material and to sit for an extended period of time.

The above skills are not intended to address the specific educational skill requirements of employers. However, Webb (1991) argues that they either directly or indirectly address many of the noncontextual basic skills considered by employers in service, manufacturing, and a variety of other businesses and industries across the U.S. to be important personal attributes. She suggests that the GED directly measures many of the behavioral and work process skills such as learning how to learn, creative thinking, problem solving, work habits and attitude that employers seek in employees. The skills measured indirectly include the less quantifiable work process skills such as leadership, teamwork and interpersonal skills, and organizational effectiveness. Those employer-recommended skills that are not addressed by the GED include speaking ability or desired attributes such as pleasant personality, willingness to accept responsibility, integrity, and neat appearance.

METHODOLOGY

An ex post facto research design was selected to investigate the research questions raised above. Ex post facto research is systematic empirical inquiry in which the researcher does not have direct control of independent variables, (e.g., the age, gender, ethnicity, grade levels completed, motivation of subjects, etc.) because their manifestations have already occurred (Kerlinger, 1973). Therefore, inferences about relations among variables are made without direct intervention, from concomitant variation of independent and dependent variables (e.g., rates of passing, failing, or not completing the GED Tests). Given that GED test examinees come already assigned to the groups who were affected by the change in score requirements (e.g.,

BEST COPY AVAILABLE

those taking the tests after 1988) and those not affected by these requirements (eg., those taking tests prior to 1988), the researcher cannot state a causal connection. There are a number of other variables (or combinations) which may cause a statistically significant interaction. Because it is possible to set up and test alternative or "control" hypotheses, the goal is to identify every rational explanation of new phenomena, and to develop every tenable hypothesis respecting its cause and history (Kerlinger, 1973).

Kerlinger (1973) also argues that the method of testing alternative hypotheses is particularly important in ex post facto studies, because it is one of the only ways to "control" the independent variables of such research. This approach calls for a simulated "before-after" design in which the researcher uses as pretest measures the measures of another group which are chosen to be as similar as possible to the experimental group and thus a control group of a sort. However, the controls are weak, a result of the inability to know that the two groups were equivalent before the treatment.

Sampling Process

The research employed a two-stage sampling design through which data could be collected from a representative sample of Wisconsin GED test examinees for two years: 1986 and 1989. During phase one, a "selection with probabilities proportional to size" random sampling process (Kish, 1965) was used to select the GED test storage sites from which to collect data. This sampling design was considered to be the most appropriate because it allowed test sites of varying sizes proportional representation in the final sample. Information obtained from DPI and a telephone survey of active test sites indicated there were 47 storage sites in the state. The study sought to collect data from about one third of the sites, therefore 16 (34 %) of the sites were targeted. The last full year before the implementation of score requirements was 1986. Examinees during this year appeared to be typical of those that preceded them in terms of the numbers tested, and the percentage completing and passing the tests: 14,157 were tested, 8,319 completed all five tests, and 7,806 (or 78.4 percent) met the score requirements (1986 GED Statistical Report) Therefore, the 1986 examinees served as a "quasi" control group.

The second year for data collection was 1989, which was a full year after the implementation of the score requirements. This group of examinees served as a "quasi" experimental group. During this year about 7,228 examinees were tested in Wisconsin: 3,311 completed all five tests, and 2,671 (69.1 percent) met the new score requirements (1989 GED Statistical Report).

Data files were obtained on a sample of 30 examinees from each site, for each year. Therefore, a sampling frame was created which rank ordered each storage site in terms of the number of examinees tested in 1989 and a sampling fraction was computed and used to establish eight zones, from which two of the sites could be selected. The total sample for each year was 480, and the total for both years was 960. For 1986 the sample represents 3.39 percent of the population and each examinee in the sample represents about 29.49 persons in the population. For 1989, the sample represents 6.64 percent of the population and each examinee represents about 15.06 examinees in the sample.

The data collection process was carried out over a five month period by the principle investigator and a graduate assistant. Eleven of the sites were visited, by either the principle investigator or the graduate assistant, and a table of random numbers was used to select individual examinee files for the study. On other occasions, GED test officials at the sites were provided with instructions for conducting random surveys and given a set of random numbers to select files for the study. Complete files with addresses, GED test scores, test sites, age, last grade completed, reason for taking the tests, and other data were obtained on 900 examinees. In the remaining case, state law prohibited officials at a correctional facility from releasing personal data on current or previous inmates. Therefore, officials at the site complied with a request to provide specific demographic and GED related data on a random number of 60 individual inmates who took the tests in either of the two years. Therefore, this phase of the sampling process was completed with a sample of 960 examinee data files.

During the second phase, a follow-up survey was mailed to 900 of the individuals included in the original sample. The sample of sixty obtained from the correctional facility were excluded from the follow-up sample because of the above referenced legal requirements. Data collection was terminated after a second follow-up survey was sent to those examinees who did not respond to the first mailing. A total of 347 surveys were returned by the Post Office as "not deliverable". Completed surveys were returned by 206 respondents, and 553 did not respond. Therefore the effective response rate was 37.25 percent.

Using Chi-square and t-tests, an analysis was conducted to determine the extent to which those who did return the surveys differed from those who did not return them. The Chi-square analyses, at the .05 level of significance, was employed to determine the extent to which there were significant differences in the gender, age, and status (i.e., passed, failed, or did not complete the GED). These analyses found no significant gender differences for the 1986 examinees. However, for both years, those returning surveys

BEST COPY AVAILABLE

differed significantly from their counter parts who did not return them. For those taking tests in 1989, significantly more women (34.6%) returned surveys than men (17.7 percent).

For both years, significantly more older examinees (i.e., those ages 19-35 and 36-70) completed surveys compared to younger examinees (i.e., those 17 and 18 years of age). Significantly more of the examinees who passed the GED tests returned the surveys, compared to those who either failed or did not complete them. Additionally, t-tests of total score means and average score means revealed that for both years, those who returned the surveys obtained significantly higher scores than those who did not return them.

Limitations of the Study

In addition to the design weaknesses that are endemic to an ex post facto research design, this study's small rate of return for mail surveys is also problematic. Although the overall return rate of 37.25 percent is "good" for GED examinees in comparable studies, e.g., Cevero (1983), the fact that those who returned the surveys were statistically not representative of the demographic makeup of the original samples for each year raise questions of validity. However, given that the addresses for the 1986 sample were five years old, and the 1989 addresses were two years old, this problem was not unexpected. These data represent the best data available, therefore, they were used to carry-out the purposes of the study. However, the findings from these data should be interpreted with caution.

Instrumentation

The Survey instrument (see appendix I) consisted of an eight-page survey form which was developed in two stages. First, questions of interest were drawn from a variety of published and nonpublished GED related research, and the resulting questionnaire was revised several times to meet the content requirements of the principle investigator and the graduate assistant. Second, a draft of the survey was mailed to a sample of 60 GED test examinees, who were not part of the final sample. Based on their response patterns to questions in the survey and their responses to queries regarding the statements and questions on the survey, several questions were eliminated, revised, or changed in the format of the survey. The final survey was comprised of "closed item-response choices," and obtained data on each examinees' motivations for and process(es) used to take the GED; employment information; other benefits of the GED; and demographic information.

ANALYSIS OF DATA

The 1987 changes in Wisconsin's GED score requirements could have initiated a variety of changes in the attitudes, perspectives, and behaviors of examinees at several levels of the GED testing process. This study sought to determine the nature and extent of these changes by employing a variety of quantitative statistical analyses to address the research questions raised above. For each analysis the probability level was set at .05.

Examinees' Entering Characteristics

The first research question is concerned with the extent to which the changes in score requirements effected the demographic and academic characteristics of the two groups of examinees. The data presented in Table 1 compares the demographic and academic characteristics of 1986 and 1989 examinees. Analysis of Variance tests were used to test the null hypothesis that the gender and ages of the examinees did not change significantly during the two years. The analysis found that there were significantly more women (52.7 percent) than men (45.4 percent) who took the tests in 1989 and that the 1989 examinees were significantly older (i.e., averaging 25.3 years of age) than those in 1986 who average 24.89 years of age. Therefore, the null hypothesis was rejected.

Insufficient data was obtained on the race/ethnicity of the examinees, however, an analysis of variance test was used to test the null hypothesis that there were no significant differences in the participation of examinees from Urban vs. Rural locations of the test sites during the two years. No significant differences were found, therefore, the hypothesis was accepted. Chi-square analyses of "Last Grade Completed", "Grades Obtained in High School", "Marital Status", and "Reason for Pursuing the GED" found no significant differences. Although the reasons for taking the tests changed only slightly during the two years, the majority of examinees during both years took the tests to obtain further education and employment. The greatest change occurred in the 16.32 percent of those who took the tests for personal satisfaction in 1989 compared to .006 percent in 1986.

BEST COPY AVAILABLE

Table 1.
Demographic and Academic Characteristics of the Sample

Characteristics	1986 N	1986 %	1989 N	1989 %
Gender:				
Female	216	45.0	253	52.7
Male	250	52.1	218	45.4
Ethnicity:				
African American	20	4.2	33	6.9
Hispanic	3	.6	12	2.5
White	85	17.7	234	48.8
Asian			2	.4
American Indian	1	.2	3	.6
Missing	371	77.3	196	40.8
Reason for GED:	N = 325 Responses		N = 288 Responses	
Further Educ.	183	56.31	148	51.39
Employment	87	26.77	65	22.57
Military	15	4.62	8	2.78
Personal Satisfaction	2	.006	47	16.32
Other	38	11.69	20	6.94
GED Status:				
Passed	373	77.7	240	50.0
Failed	33	6.9	80	16.7
Not Complete	74	15.4	160	33.3
Last Grade Completed:	N = 380 Responses		N = 371	
Grades 4 to 9	89	23.4	85	22.9
Grade 10	123	32.36	127	34.2
Grades 11 or 12	168	44.21	159	42.8
Grades in High School:	N = 79		N = 127	
About "B+" and Above	10	12.7	15	11.8
Mostly "C" to "B"	34	43.0	63	49.6
About "C-" and Below	35	44.3	49	38.6
Age:	N = 480		N = 480	
Mean	24.89		25.30	
Standard Deviation	9.57		9.11	
Last Grade Completed:	N = 380		N = 372	
Mean	10.15		10.19	
Standard Deviation	1.1		1.1	

Table 2 provides a descriptive profile of the 1986 and 1989 examinees who returned surveys. Although this sample is more representative of the 1989 examinees, due to their higher return rate, it does provide some useful insight into the perceptions and behaviors of 1986 examinees. The data in both tables will be analyzed in greater depth in subsequent analyses.

Table 2

Descriptive Characteristics of the Sample: 1986 and 1989

Characteristics	1986		1989	
	N	%	N	%
Pursued Study Options:	48	60.8	105	82.7
Study Options:	N = 79		N = 127	
Personal Tutor	15	19.0	39	30.7
Video Programs	11	13.9	35	27.6
Studied alone--Books	35	44.3	82	64.6
Practice Tests	31	39.2	80	63.0
Instructional T.V.	9	11.4	32	25.2
Attended Learning Center/Class:	51	64.6	93	73.2
Number of Weekly Hrs. Studied:				
2 Hrs. or less	30	40.0	31	24.4
3-10 Hrs.	34	43.0	70	55.1
11 or more Hrs	12	15.2	23	18.1
Number of Weeks Studied:				
4 Wks. or less	32	40.5	41	32.3
5-16 Wks.	29	36.7	42	33.1
17 or more Wks.	13	16.5	39	30.7
Main Wage Earner:	42	53.2	50	39.4
Income in 1990:				
0--$4,999	9	11.4	35	27.6
$5,000--$10,999	15	19.0	42	33.1
$11,000--$19,999	30	38.0	28	22.0
$20,000--and Over	19	24.1	18	14.2
Told GED is Required for Employment:	40	50.1	74	58.3
1-2 times	10	12.7	25	19.7
3 or more times	17	21.5	31	24.4

Table 2 Continued

Descriptive Characteristics of the Survey Sample: 1986 and 1989

Characteristics	1986 N	1986 %	1989 N	1989 %
Current Employment Status:				
Full-Time 35+ Hrs./Wk	56	71.0	75	58.1
Part-Time -35 Hrs./Wk	9	11.4	15	11.8
Unemployed--Looking	7	8.9	15	11.8
Unemployed--Not Looking for work	5	6.3	19	15.0
Employment Status Prior to taking the GED:				
Full-Time	30	38.0	49	38.6
Part-Time	11	13.9	19	15.0
Unemployed--Looking	7	8.9	17	13.4
Unemployed--Not Looking	9	11.4	16	12.6
Primary Source of Financial Support:				
Personal Employment				
Public Ass't.	44	55.7	68	53.6
Spouse	4	5.1	25	19.7
Other	19	24.1	24	18.9
	8	10.1	7	5.5
Public Ass't. Status:				
Received before GED	11	13.9		
Received during GED	9	11.4	42	33.1
Received after GED	9	11.4	35	27.6
Currently receive PA	5	6.3	32	25.2
			24	18.9
Income since taking the GED:				
Increased	46	58.2	47	37.0
Decreased	3	3.8	12	9.4
Has not changed	24	30.4	62	49.0
Enrolled in Education/ Training Program:	26	32.9	47	37.0

Examinees' Reactions

The second research question seeks to determine the extent to which the two groups of examinees differed significantly in the strategies they used to prepare for the GED tests and in their assessments of the effectiveness of the preparation programs they attended. Data in Table 2 provide some of the examinees' survey responses to questions involving their study strategies. These data suggest that from 1986 to 1989 the percentage of examinees pursuing study options other than taking classes, e.g., personal tutor, video programs, etc., increased by 21.9 percent. Although all of the study options listed experienced increases, the greatest increases occurred in the areas of using practice tests (23.8%) and studying alone using GED preparation books (20.3%). Also, the percent of examinees who participated in classroom instruction increased a modest 8.6 percent between the two years.

A Chi-square analysis of three categories of weeks of study (0-4, 5-16, and 17 or more) [see Table 2] was conducted to test the null hypothesis that there were no differences between the 1986 and 1989 examinees. The analysis found that the 1989 examinees studied for significantly more weeks than those in 1986: 32 percent of the 1989 examinees studied 17 or more weeks compared to 17.6 percent of the 1986 examinees. Also 36.6 percent of the 1989 examinees studied 0-4 weeks, compared to 43.2 percent of the 1986 examinees ($X^2 = 4.23, df = 1, P < .04$). The null hypothesis was rejected. A similar analysis of the number of hours studied per week found no significant differences, and the null hypothesis was accepted.

Another analysis was conducted to determine if there were differences in the number of weeks 1989 examinees studied as compared to their pass/fail rates. A Chi-square analysis of the three categories of weeks studied found that significantly more of the examinees in 1989 who failed (47.6%) were among those who studied 17 or more weeks, as compared to the low percentage of those who passed (23.8%). Also, 19 percent of the 1989 examinees who failed studied 0-4 weeks, and 41.3 percent of those who passed studied for this period ($X^2 = 8.85, df = 1, P < .003$).

The data in Table 3 examine the null hypothesis that examinees' assessment of their experiences in adult secondary education classes and programs did not differ significantly between 1986 and 1989. This hypothesis was accepted for all the statements except the first one, i.e., Knowledge Development. Significantly more of the 1986 examinees (88 percent) compared to (76 percent) of 1989 examinees positively responded to the statement ($X^2 = 4.47, df = 1, P < .04$).

Although no other significant differences were found, the examinees' responses do reveal a favorable disposition toward academic integration statements (i.e., # 1 - 4). A total of 87 percent of 1986 examinees and 77.25 percent of 1989 examinees agreed to the positively worded statements. However, these patterns were largely reversed for the social integration statements (i.e., # 5 - 8). A total of 60 percent of 1986 examinees and 56.75 percent of 1989 examinees disagreed with these positively worded statements.

Table 3

Examinees' Assessment of Their Experiences in
Adult Secondary Education Classes and Programs

Examinees' perception of their experiences in ABE programs.	1986 SD D A SA n (%)	1989 SD D A SA n (%)
1. I am satisfied with the extent of my knowledge development.	0 5 29 11 (0) (11) (64) (24)	8 13 49 15 (9) (15)(58) (18)
2. My experiences had a positive influence on my interest in ideas.	1 9 25 9 (2) (21) (57) (21)	6 14 47 17 (7) (17) (56) (20)
3. Instructors were genuinely superior teachers.	0 7 22 14 (0) (16) (51) (33)	7 14 34 30 (8) (17) (40) (35)
4. Instructors were generally interested in students.	0 1 29 16 (0) (2) (63) (35)	5 11 30 41 (6) (13) (35) (47)
5. I developed close personal relation-ships with other students.	10 19 8 5 (24) (45)(19) (12)	22 36 17 9 (26) (43)(20) (11)
6. Student friend-ships have been per-sonally satisfying.	7 18 9 6 (18) (45)(23) (15)	17 40 20 5 (21) (49)(24) (6)
7. Non-classroom dis-cussions with instructors influenced my personal growth.	4 14 13 8 (10) (36)(33) (21)	15 23 28 17 (18) (28)(34) (21)
8. Non-classroom dis-cussions with in-structors influenced career goals.	5 19 8 7 (13) (49)(21) (18)	10 25 32 16 (12) (30)(39) (19)

SD = Strongly Disagree
D = Disagree
A = Agree
SA = Strongly Agree

Table 4

Examinees' Assessment of how Helpful the Classes/ Programs were in Developing Academic Skills

How helpful were the classes for:	1986 NH OLH SH VH n (%)	1989 NH OLH SH VH n (%)
1. Improving reading skills.	4 8 22 11 (9) (18) (48) (24)	8 16 44 16 (10)(19) (52) (19)
2. Improving math skills.	1 3 22 21 (2) (6) (47) (45)	4 10 42 31 (5) (12) (48) (36)
3. Improving writing skills.	2 16 16 10 (5) (36) (36) (23)	9 21 34 21 (11) (25)(40) (25)
4. Increasing your knowledge of science.	4 13 22 7 (9) (28) (48) (15)	9 22 41 13 (11) (26)(48) (15)
5. Increasing your knowledge of social studies.	0 13 24 8 (0) (29) (53) (18)	6 19 45 16 (7) (22) (52) (19)
6. Improving your test-taking skills.	2 7 17 20 (4) (15) (37) (44)	4 24 30 27 (5) (28) (35) (32)
7. Increasing your self-confidence.	0 7 21 20 (0) (14) (44) (42)	6 17 24 39 (7) (20) (28) (45)
8. Helping you pre-pare for further education.	6 8 16 15 (13) (18)(36) (33)	5 19 27 35 (6) (22) (31) (41)
9. Helping you improve job related skills.	8 7 21 10 (17) (15)(46) (22)	16 24 23 23 (17) (28)(27) (27)

NH = Not Helpful
OLH = Of Little Help
SH = Somewhat Helpful
VH = Very Helpful

The data in Table 4 examine the null hypotheses that the examinees' assessment of the helpfulness of preparatory classes/programs in developing their academic skills did not differ significantly between the two years. This hypothesis was accepted for all statements. Over 78 percent of 1986 and 73.0 percent of 1989 examinees felt most adequately prepared in the areas of improving Math Skills, increasing Self-Confidence, improving Test Taking and Reading Skills, increasing their knowledge of Social Studies, and receiving help in preparation for Further Education. However, only 63.3 percent of 1986 and 60.67 percent of 1989 examinees indicated that their preparatory programs were either "somewhat" or "very" helpful in increasing their Job Related Skills, and improving their knowledge of Writing and Science.

BEST COPY AVAILABLE

Examinees' Test Performance

To address the third research question, a series of Chi- square analyses were conducted to test the null hypothesis that there were no differences in the GED status of the examinees during the two years. This analysis confirmed earlier observations that significantly more examinees failed or did not complete the tests (16.5% and 33.5%) in 1989 than in 1986 (7.1% and 15.2%) (X^2 = 69.96, df = 1, < P.000). The null hypothesis was rejected.

The data in Table 5 illustrate the dramatic difference in the pass/fail rate before and after the change in score requirements. In 1986 75 percent of students taking the tests received a passing score on the first try, compared to 48.1 percent in 1989. Although the percentage of examinees seeking retests were nearly equal for the two years (41.3 percent for 1986 and 40 percent for 1989) higher percentages of examinees in 1986 received passing scores on either their first or second retest (57 and 33.3 percent) compared to 22.2 and 8.3 percent in 1989. There was also a steep increase in the number of examinees who failed to complete all five tests. In 1986 only 15.4 percent of examinees failed to complete the tests, but in 1989 that figure increased by fifty percent to 33.3.

Additional analyses of examinees performance analyzed alternative null hypotheses concerning differences in the pass, fail, and noncompletion status of examinees for both years that might be do to age, gender, and location of test site (i.e., urban/rural). The null hypothesis in each analysis was accepted. However, in analyzing the demographic composition within each set of examinees, a significant difference was found in GED status by age for 1989 examinees. Older examinees were more likely to be among those who passed. Of those who passed, 23.2 percent were 17-18, 62.7 percent were 19-35, and 14.2 percent were 36-70. Whereas, 32.2 percent of those who failed were 17-18, 56.1 percent were 19-35, and 11.7 percent were 36-70. (X^2 = 3.92, df = 1, < P .05). Also, significantly more men (8.8 and 17.6%) than women (5.1 and 10.6%) either failed or did not complete the tests in 1986 (X^2 = 6.93, df = 1, P < .008). There were no differences in the gender related performance on the tests for 1989.

Further analysis of these data show that examinees in 1986 who completed higher grades in school were more likely than those completing fewer grades to have passed the tests. Over 50 percent of those who completed 12, 11, 9 and 8 grades in school were among those who passed. Whereas over 50 percent of those who completed 10, 7, 6 and fewer grades were among those who failed. (X^2 = 4.04, df = 1, P < .04). There were no differences, based on the grade level completed, in the performance of 1989 examinees.

Table 5

Examinee Status by Test Year: Pass, Failed and Incomplete

	All Examinees % (n)	First Retest % (n)	Second Retest % (n)
Passed			
1989	48.1 (231)	22.2 (8)	8.3 (1)
1986	75.00 (360)	57.9 (11)	33.3 (2)
Difference	-26.9 (-129)	-35.7 (-3)	-25.00 (-1)
Failed			
1989	18.5 (89)	77.8 (28)	91.7 (11)
1986	9.6 (46)	42.1 (8)	66.7 (4)
Difference	9.8 (43)	35.7 (20)	25.0 (7)
Incomplete			
1989	33.3 (160)		
1986	15.4 (74)		
Difference	17.9 (86)		

Were there significant differences between the mean scores on each test, average standard scores, and total scores of examinees for 1986 and 1989? Table 6 provides the results of a t-test analysis of the hypothesis that there were no significant differences between the mean scores of examinees for each of the two years. In each instance, the hypothesis was rejected. The 1989 examinees out performed the 1986 examinees on all tests, except the Writing Skills test. This was the only test in which the 1986 examinees out performed those in 1989. Although this difference is statistically significant, it may be of little practical value because the margin of difference is less than one point.

Additionally, the mean scores of 1986 examinees averaged 5.7 points above the 45 points required for passing each of the tests, thereby boosting their Average Standard Scores and Total Scores 5.3 and 30.8 points, respectively, above the averages required for passing. The mean scores of 1989 examinees averaged only 1.8 points above the 50 points required. Therefore the Average Standard Scores and Total Scores for 1989 examinees were only 1.3 and 14.2 points, respectively, above the averages required for passing.

BEST COPY AVAILABLE

Table 6
T-tests Analyzing Test Score Means By Year

Test	1986 Mean (n)	1989 Mean (n)	t (df)	Prob.
Writing Skills	50.06 (424)	48.62 (367)	-2.76 (784.58)	.006
Social Studies	50.88 (449)	53.20 (415)	+4.55 (847.33)	.000
Science	51.67 (450)	52.94 (411)	+2.53 (838.55)	.012
Reading	51.81 (460)	54.14 (437)	+4.15 (851.05)	.000
Mathematics	49.10 (423)	50.09 (370)	+2.02 (772.46)	.044
Average Standard Score	50.29 (480)	51.32 (478)	+2.41 (953.54)	.016
Total Scores	255.80 (407)	264.15 (318)	+3.69 (679.47)	.000

Are there significant differences in the original test score means for each individual test, Average Standard Scores, and Total Scores for examinees in 1986 and 1989 who took all five test? Table 7 provides the results of t-tests which were conducted to test the null hypothesis that there were no significant differences in the mean scores for each group of GED examinees who took all five tests. These hypotheses were rejected for all test score means, with the exception of the Writing Skills test.

Those examinees taking all five tests for the first time had scores well above the average requirements for passing during their respective years. The 1986 examinees averaged 7.34 points above the 45 points required for each test and 7.21 and 36.73 points respectively above the requirements for the Average Standard Score and Total Scores. The 1989 examinees averaged 5.5 points above the 50 points required for each test, and 5.5 and 27.8 points respectively above the requirements for the Average Standard Score and Total Scores. In direct comparisons, the test scores of the 1989 examinees were significantly higher than those of the 1986 examinees for all tests, except the Writing Skills test. However, the margin of points above the average required was consistently highest for the 1986 examinees.

Table 7

T-tests Analyzing Original Test Score Means by Year
for Examinees Taking All Five GED Tests

Test	1986 Mean n = 360	1989 Mean n = 230	t (df)	Prob.
Writing Skills	51.43	51.44	.03 (526.63)	.98
Social Studies	52.76	57.47	9.06 (509.74)	.000
Science	53.46	56.87	6.59 (500.27)	.000
Reading	53.79	59.08	8.72 (456.16)	.000
Mathematics	50.26	52.88	5.29 (518.26)	.000
Average Standard Score	52.21	55.48	7.97 (549.47)	.000
Total Scores	261.73	277.81	7.92 (546.48)	.000

Were there significant differences in the mean scores for each test, Average Standard Scores, and Total Scores for examinees who failed their original tests and took retests in 1986 and 1989? Table 8 provides the results of t-tests which were conducted to test the null hypothesis that the differences in mean scores of retest examinees were not statistically significant for the two years. For each of the tests, and for both the Average Standard Scores and Total Scores, the hypothesis was rejected.

The 1986 retest examinees averaged 2.9 points below the 45 points required for passing each test, and 3.0 and 14.5 points respectively below the averages requires for Average Standard Scores and Total Scores. However, the 1989 retest examinees averaged 4.3 points below the 50 points required for passing each test, and 4.5 and 21.8 points respectively below the requirements for Average Standard Scores and Total Scores. In direct comparisons, the 1989 examinees obtained test scores that were significantly higher than those of the 1986 examinees for each test and for Average Standard Scores and Total Scores. However the 1986 retest examinees maintained average scores that were consistently closest to their requirements for passing.

BEST COPY AVAILABLE

Table 8

T-tests Analyzing Retest Score Means by Test Year
of Examinees who Failed Their First Test

Test	1986 Mean n = 46	1989 Mean n = 89	t (df)	Prob.
Writing Skills	40.76	43.65	4.00 (124.16)	.000
Social Studies	42.11	46.32	5.51 (100.42)	.000
Science	43.22	47.48	6.06 (124.76)	.000
Reading	43.41	46.69	3.63 (94.25)	.000
Mathematics	41.04	44.17	3.30 (102.51)	.001
Average Standard Score	41.98	45.51	7.34 (119.19	.000
Total Score	210.54	228.17	7.22 (118.51)	.000

Is there an interaction between the effects of age and test-year that could account for the differences in average scores? The F-value associated with age provides a test of the hypothesis that age does not affect Average Standard Scores. The F-values associated with test-year tests the hypotheses that test-year has no main effect on Average Standard Scores. The F-value associated with the interaction between age and test-year tests the hypothesis that age does not interact with test year, i.e., that there were no differences in the Average Standard Scores among the age groups across the two years. The data in Table 9 indicate statistically significant main effects due to age and test-year, but a nonsignificant level of interaction. The hypothesis that age differences had no effects on Average Standard Scores was accepted. Other analyses of variance computations tested the null hypotheses that gender, and geographical location (urban vs. rural), had no affect on the Average Standard Scores across the two years. These analyses did not result in significant levels of interaction, and the hypotheses were accepted.

Table 9

Analysis of Variance of Average Standard Score
by Age and Test-Year

Source	SS	df	MS	F	Sig.
Main Effects	1211.44	3	403.813	11.20	.000
Age	709.17	2	354.59	9.83	.000
Test-Year	458.24	1	458.42	12.70	.000
2-Way Interaction	167.14	2	83.57	2.32	.099
Age Test-Year	167.14	2	83.57	2.32	.099
Explained	1378.58	5	275.72	7.64	.000
Residual	25357.97	703	36.07		
Total	26736.55	703	37.76		

Table 10

Analysis of Variance of Reading Test Scores
by Age and Test-Year

Source	SS	df	MS	F	Sig.
Main Effects	2436.84	3	812.28	11.90	.000
Age	1200.13	2	600.07	8.79	.000
Test-Year	1092.44	1	1092.44	16.01	.000
2-way interactions	527.65	2	263.82	3.87	.021
Age Test-Year	527.65	2	263.82	3.87	.021
Explained	2964.49	5	292.90	8.69	.000
Residual	59577.55	873	68.25		
Total	62542.04	878	71.23		

Does age, gender, and geographical location interact with test-year for the mean scores on each of the tests? To test the hypothesis that there was no interaction between age, gender, and geographical location and test score means, two-way ANOVAs were computed to test each hypothesis. The hypotheses were accepted for all tests except the Reading test. On the Reading test, a significant interaction occurred which could explain the high average score (54.14) obtained for the 1989 examinees, compared to the (51.81) average for 1986 examinees (see Table 10). Apparently, older examinees are significantly better readers, and

BEST COPY AVAILABLE

because they made up a significantly larger segment of 1989 examinees, they made a significant difference in the Reading test score.

Test Performance of Noncompleters

The fourth research question addressed the concern that the increased score requirements could have been a disincentive for those examinees in 1989 who failed to complete all five tests. That is, were there significant differences in the original mean scores on each of the tests and Average Standard Scores, for examinees who did not complete all five tests in either 1986 or 1989? Table 11 provides the results of t-tests which were conducted to test the hypothesis that there were no significant differences in the mean scores of 1986 and 1989 noncompleters. Given that 1989 noncompleters significantly out performed 1986 noncompleters on two of the tests, this hypothesis was rejected for the Social Studies and Reading tests, and Average Standard Scores, but was accepted for the Writing Skills, Science, and Mathematics tests.

Table 11

T-tests Analyzing Original Score Means by Test Year
for Examinees Who did Not Complete All Five Tests

Test	1986 Mean (n)	1989 Mean (n)	t (df)	Prob.
Writing Skills	46.61 (18)	44.35 (48)	-1.02 (25.86)	.318
Social Studies	44.49 (43)	49.37 (96)	3.89 (83.50)	.000
Science	45.91 (44)	48.38 (92)	1.90 (88.77)	.060
Reading	45.81 (54)	50.11 (118)	3.66 (133.84)	.000
Mathematics	46.35 (17)	47.82 (51)	.63 (23.64)	.533
Average Standard Score	46.04 (74)	48.60 (159)	2.57 (143.51)	.011

Those examinees who did not complete all five tests in 1986 averaged .83 points above the 45 points required for each test and 1.0 point above the requirement for Average Standard Scores. However, the 1989 noncompleters averaged 2.0 points below the 50 points required for each test, and 1.4 points below the requirement for the Average Standard Score. Noncompleters in 1989 tended to score fewer than the average of 50 points needed to pass the tests in that year. This is true of 4 of the five tests and the Average Standard Score. In contrast, on 4 of the five tests, 1986 examinees did obtain the 45 point average needed to pass the tests in that year.

Table 12

T-tests Analyzing the Mean Scores of Completers and Noncompleters for 1986

Test	Completers Mean (n)	Noncompleters Mean (n)	t (df)	Prob.
Writing Skills	50.22 (406)	46.61 (18)	1.79 (18.23)	.09
Social Studies	51.56 (406)	44.49 (43)	6.50 (52.11)	.000
Science	52.30 (406)	45.91 (44)	5.78 (52.33)	.000
Reading	52.61 (406)	45.81 (54)	7.19 (73.09)	.000
Mathematics	49.21 (406)	46.35 (17)	1.35 (16.82)	.196
Average Standard Score	51.05 (406)	46.04 (74)	5.73 (93.84)	.000

The extent to which the mean scores of completers differed from those of noncompleters for a given year could provide additional evidence of the extent to which the new score requirements served as a disincentive for 1989 noncompleters. To test the null hypothesis that the mean scores of noncompleters did not differ significantly from those of completers for 1986, t-tests were conducted on all five tests and Average Standard Scores for these two groups. Table 12 provides the results of the analysis. The null hypothesis was rejected for those examinees who took the Social Studies, Science and Reading tests, and for the Average

BEST COPY AVAILABLE

BEST COPY AVAILABLE

Standard Scores of examinees. The hypothesis was accepted for those examinees who took both the Writing Skills and Mathematics tests.

The mean scores for Completers averaged 6.2 points above the 45 required for each test and 6.1 points above the requirements for the Average Standard Scores. The mean scores of Noncompleters averaged only .83 points on each test, and 1.0 points for the Average Standard Score above the requirement.

A similar t-test was conducted on the mean test scores of 1989 examinees who either completed or failed to complete the tests. Table 13 provides the results of this analysis. The null hypothesis of no difference between the two groups was rejected for each test and the Average Standard Score. On each test, Completers significantly out performed Noncompleters.

Also, the mean scores for Completers averaged 2.8 and 2.7 points above the 50 points required for each test and the Average Standard Score. However, the mean scores for Noncompleters averaged 2.0 and 1.4 points below the requirements for each test and the Average Standard Score.

Table 13

T-tests Analyzing the Mean Scores on Completers and Noncompleters for 1989

Test	Completers Mean (n)	Noncompleters Mean (n)	t (df)	Prob.
Writing Skills	49.27 (318)	44.35 (159)	4.64 (62.5)	.000
Social Studies	54.37 (318)	49.36 (96)	6.04 (167.1)	.000
Science	54.26 (318)	48.38 (92)	6.81 (144.6)	.000
Reading	55.62 (318)	50.11 (118)	5.94 (216.5)	.000
Mathematics	50.46 (318)	47.82 (51)	2.46 (66.0)	.016
Average Standard Score	52.70 (319)	48.60 (159)	6.20 (277.4)	.000

Personal Benefits of the GED Credential

The fifth research question is concerned with the personal benefits that might accrue to examinees who possess the GED credential. A Chi-square analysis of some of the data contained in Table 2 tested the null hypothesis that there were no significant differences in the proportions of examinees who enrolled in education or training programs for the two years. The analysis found that a significantly higher percentage of 1989 examinees had enrolled in educational/training programs compared to those in 1986: 37 percent of 1989 examinees versus 32.9 percent of 1986 examinees were enrolled ($X^2 = 5.72$, df = 1, < P .017). The hypothesis was rejected.

Additional analysis of these data found that a significantly higher percentage of those in 1986 who indicated further education (57.1%), employment (19%) or other (23.8) as a reason for pursuing the GED also indicated that they had enrolled in an educational or training program ($X^2 = 3.71$, df = 1, $P < .05$).

Perceptions of the Degree to Which the GED was Helpful

Over 50 percent of both 1986 and 1989 examinees who possessed the GED certificate indicated it was either somewhat or very helpful in their efforts to qualify for two-year college and to get a job (see Table 14). Conversely, a majority of the examinees from both years indicated the GED was either "not helpful" or "of little help" in getting a Promotion, or Keeping a Job. There was a statistically significant difference in the perceptions of examinees regarding the helpfulness of the GED toward Entering Four-year College: over 55 percent of 1989 examinees rated it as helpful, while over 70 percent of 1986 examinees rated it as not helpful ($X^2 = 6.93$, df = 1, $P < .008$).

BEST COPY AVAILABLE

Table 14

Examinees' Assessment of the Extent to Which
They have Found the GED to be Helpful

How helpful was the GED to:	1986 NH OLH SH VH n (%)	1989 NH OLH SH VH n (%)
1. Get a job.	11 11 16 19 (19) (19) (28) (33)	16 13 12 22 (25) (21) (19) (35)
2. Keep a job.	20 9 13 13 (36) (16) (24) (24)	22 16 8 7 (42) (30) (15) (13)
3. Get a Promotion.	25 15 7 6 (47) (28) (13) (11)	26 15 8 6 (47) (27) (15) (11)
4. Qualify for two-year college.	17 0 8 15 (43) (0) (20) (38)	15 2 6 31 (28) (4) (11) (57)
5. Qualify for four-year college.	22 1 2 6 (71) (3.2) (7) (19)	19 1 6 19 (42) (2) (13) (42)

NH = Not Helpful
OLH = Of Little Help
SH = Somewhat Helpful
VH = Very Helpful

Societal Impact of Possessing the GED

The sixth research question is concerned with the effect of the changes in score requirements on examinees' employment status, income, and means of financial support. A Chi-square analysis was used to test the null hypothesis that there were no differences in employment status during the two years. It found that there were significantly more examinees employed in 1986 (either full time 71.0% or part-time, 11.4%) than in 1989 (58.1% full time and 11.8% part-time) (X^2 = 4.46, df = , P < .04). The hypothesis was rejected. However, this finding could have resulted from the fact that the 1986 examinees had their credentials longer and thereby had more time to prepare for and search for employment.

Therefore, an alternative hypothesis was examined, i.e., that there were no differences in those examinees in 1989 who possessed a GED credential and those who did not (i.e., those who either failed or did not complete). This analysis found that those examinees who passed in 1989 were significantly more likely to be employed either full-time (67.1%) or part-time (13.9%) than those who failed (48.9 percent full time and 8.9 percent part-time). ($X^2 = 4.46$, $df = 1$, $P < .04$). The hypothesis was rejected.

Another aspect of personal benefit is personal income. A Chi-square analysis was conducted to test the hypothesis that there were no differences in the personal incomes of examinees during the two years. This analysis found that there were significantly more examinees in 1986 who indicated they were in the higher income groups: 67.1 percent earned over $11,000.00 annually, compared to only 37.4 percent of the 1989 examinees ($X^2 = 13.907$, $df = 1$, $P < .000$). The hypothesis was rejected.

There was also a significant difference between the "employment status" and "primary source of financial support" for 1989 examinees. A total of 60 percent and 33.3 percent of those "unemployed and looking for work", and 50 percent and 44.4 percent of those "unemployed and not looking for work" were either on public assistance or relied on a spouse or other nongovernment form of financial support ($X^2 = 33.7$, $df = 1$, P .000).

An additional analysis found that there was a significant difference in the employment rate when compared to the last grade completed for 1989 examinees: those who completed higher grade levels were more likely to be employed ($X^2 = 4.90$, $df = 1$, $P < .03$).

Differential Rates of Passing With Changing Score Requirements

The seventh research question seeks to determine the differential rates of passing for GED examinees and the 1987 Norming Sample, given changing score requirements. The American Counsel on Education (ACE) identifies several different score requirement formulas that are utilized by different states and territories. Table 15 provides an analysis of the percent of GED examinees who would have passed in 1986 and 1989 given five different score requirements, and compares these with the results of the 1987 Wisconsin Norming Study. These data suggest that in the first three score requirement formulas, the GED examinees would have obtained higher passing percentages than the norming sample. Under the fourth formula, the

BEST COPY AVAILABLE

norming group out performed the 1986 GED group, but were out performed by the 1989 group. Under the fifth requirement, the norming group slightly out performs the 1989 group, but greatly outperforms the 1986 group. As expected there is an inverse relationship between the increasing score requirements in the formulas and the percentage of examinees and norming study participants obtaining passing scores.

Given the 1986 score requirements, 88.9 percent of the 1986 examinees passed the GED, and 90.3 percent of the 1989 examinees would have passed. However, given the 1989 score requirements only 54.7 percent of the 1986 examinees would have passed (a difference of 34.2 percent (or a decline of 139 examinees); and 71.6 percent of 1989 examinees did meet the score requirements, which is a decline of 18.7 percent (or 60 examinees) from those who would have passed in 1986.

Table 15

Effects of Different Score Requirements on Passing
For 1986 and 1989 GED Examinees and 1987 Norming Sample

Score Requirements	1986 (N = 406) Passing n (%)	1989 (N = 320) Passing n (%)	1987 (N = 913) Passing n (%)
Minimum of 35 and an Average of 40	396 (97.5)	306 (95.6)	830 (91.0)
Minimum of 35 and an Average of 45*	361 (88.9)	289 (90.3)	767 (84.0)
Minimum of 40 and an Average of 45	344 (84.7)	283 (88.4)	721 (79.0)
Minimum of 40 and an Average of 50**	222 (54.7)	229 (71.6)	603 (66.0)
Minimum of 45 and an Average of 50	205 (50.5)	189 (59.1)	557 (61.0)

* = The score requirement for 1986.
** = The score requirement for 1989.

Differential Rates of Passing Given Minimum Scores

The eighth research question is concerned with the differential rates of passing for the GED examinees and the 1987 Norming Sample, given four minimum scores: 35, 40, 45 and 50. The majority of the states currently employ minimum scores of either 35 (30 states) or 40 (19 states). Only one state has a minimum requirement of 45, and in that state the score of 45 is the sole requirement for passing the tests.

This section analyses the passing rates of the 1986 and 1989 GED examinees and the 1987 Norming sample, given these different minimum scores.

Table 16

Effects of Minimum Score Requirement of 35 on Rates of Passing
Individual Tests: 1986 & 89 GED Examinees and 1987 Norming Sample

Minimum Score: 35	1986 Tested	1986 Passed	1989 Tested	1989 Passed	1987 Tested	1987 Passed
Test	N	n (%)	N	n (%)	N	n (%)
Writing	424	421 (99.3	367	362 (98.6)	913	895 (98.0)
Soc. Studies	449	445 (99.1)	415	412 (99.3)	913	886 (97.0)
Science	450	449 (99.8)	411	407 (99.0)	913	886 (97.0)
Reading	460	456 (99.1)	437	433 (99.0)	913	877 (96.0)
Mathematics	423	419 (99.1)	370	365 (98.6)	913	895 (98.0)

With a minimum score requirement of 35 on each individual test, Table 16 illustrates that nearly all GED test examinees would have passed each test and almost an equal percentage of high school students in the norming study would have passed.

BEST COPY AVAILABLE

Table 17

Effects of Minimum Score Requirement of 40 on Rates of Passing
Individual Tests: 1986 & 89 GED Examinees and 1987 Norming Sample

Minimum Score: 40 Test	1986 Tested N	1986 Passed n (%)	1989 Tested N	1989 Passed n (%)	1987 Tested N	1987 Passed n (%)
Writing	424	400 (94.3)	367	340 (92.6)	913	831 (91.0)
Soc. Studies	449	428 (95.3)	415	401 (96.6)	913	840 (92.0)
Science	450	436 (96.9)	411	398 (96.8)	913	849 (93.0)
Reading	460	443 (96.3)	437	423 (96.8)	913	822 (90.0)
Mathematics	423	390 (93.2)	370	345 (93.2)	913	849 (90.0)

With a minimum score of 40 on each individual test, Table 17 illustrates that close to 95 percent of GED examinees would have passed the tests and over 90 percent of the students from the high school norming study would have passed. Compared to the minimum score of 35, there is greater differentiation within each group in terms of the difficulty level of the tests. For example, only 92.6 percent of those taking tests in 1989 passed the Writing test, compared to 96.8 percent who passed both the Science and Reading tests.

Table 18

Effects of Minimum Score Requirement of 45 on Rates of Passing
Individual Tests: 1986 & 89 GED Examinees and 1987 Norming Sample

Minimum Score: 45 Test	1986 Tested N	Passed n (%)	1989 Tested N	Passed n (%)	1987 Tested N	Passed n (%)
Writing	424	317 (74.8)	367	256 (69.8)	913	730 (80.0)
Soc. Studies	449	371 (82.6)	415	365 (88.0)	913	749 (82.0)
Science	450	384 (85.3)	411	365 (89.0)	913	767 (84.0)
Reading	460	386 (83.9)	437	375 (85.8)	913	721 (79.0)
Mathematics	423	324 (76.6)	370	296 (80.0)	913	749 (82.0)

With a minimum score of 45, (Table 18) the 1989 examinees would have out performed both the 1986 GED examinees and the 1987 norming sample on three of the five tests: Social Studies, Science, and Reading. The Norming sample would have outperformed both groups of GED examinees on the Writing and Mathematics tests. The largest percentage of examinees passed the Science tests in all three groups and the lowest percentage failed the Writing tests for all three groups.

Among the three groups, the greatest amount of variation in the percentage of those passing occurred among the 1989 examinees. Among this group there is a difference of 19.2 percentage points between the lowest rate of passing (69.8% for the Writing test) and the highest rate of passing, i.e., 89 percent for the Science test. This is compared to a variance of 5 percentage points for the norming sample and 10.5 for the 1986 examinees.

Table 19

Effects of Minimum Score Requirement of 50 on Rates of Passing
Individual Tests: 1986 & 89 GED Examinees and 1987 Norming Sample

Minimum Score 50	1986 Tested	1986 Passed	1989 Tested	1989 Passed	1987 Tested	1987 Passed
Test	N	n (%)	N	n (%)	N	n (%)
Writing	424	214 (50.5)	367	148 (40.3)	913	584 (64.0)
Soc. Studies	449	247 (55.0)	415	285 (68.7)	913	612 (67.0)
Science	450	279 (62.0)	411	291 (70.8)	913	612 (67.0)
Reading	460	275 (59.8)	437	298 (68.2)	913	548 (60.0)
Mathematics	423	194 (45.9)	370	194 (52.4)	913	593 (65.0)

With a minimum score of 50 on each of the tests, the passing rate decreases significantly for all examinees. The steepest decline would have occurred with the percentage (40.3%) of those in 1989 who would pass the Writing test and the highest passing rate (70.8%) would have occurred for those passing the Science tests in 1989. The norming sample would have out performed both groups of GED examinees on the Writing and Math tests. The 1989 examinees would have out performed the other two groups on the Social Studies, Science and Reading tests. The 1986 examinees would out perform the 1989 examinees on the Writing test but would not out perform either of the other two groups on any of the other tests. Therefore, in direct comparisons, the 1989 examinees compares favorably with the performance of the 1987 norming sample.

Again, the 1989 examinees had the greatest amount of variability with a spread of 30.5 percent between the lowest (40.3%) of passing the Writing test to the 70.8 percent passing the Science test. These figures contrast with the 7 percentage points that separate those in the norming sample. Their most difficult test was the Reading test in which 60 percent passed, and the least difficult were the Social Studies and Science tests in which 67 percent passed. The 1986 examinees also varied greatly with 16.1 percentage points

separating the highest percent of passing (62% for the Science test) compared to 45.9 percent who would have passed the mathematics test.

DISCUSSION

The above data analysis provides evidence that the changes in score requirements significantly effected those GED examinees who took the tests after the new requirements were operationalized. The data analyzed in this study point to several primary effects of the increased score requirements.

No Effects on the Demographic and Academic Composition of Examinees

There were no relevant significant changes in the demographic and academic characteristics of the examinees from 1986 to 1989. Although there were insufficient data to analyze the effects of minorities in the samples, the significant increase in women and older learners were not found to be related to the academic performance of 1989 examinees in terms of their GED Status, Average Standard Scores, and Total Scores.

Increased Academic Preparation and Performance

The 1989 examinees significantly increased their academic preparation efforts in order to attain the higher minimum and average scores. They pursued a wider array of study options and while they studied for about the same number of hours per week as the 1986 examinees, they studied for significantly more weeks. The increased efforts apparently resulted in the statistically significant increase in academic performance of the 1989 examinees compared to those in 1986. Normative comparisons via t-tests between the two groups regarding all scores on all five tests, original scores on all five tests, and retest scores of examinees who failed their first tests consistently found that 1989 examinees significantly outperformed 1986 examinees on all tests, except the Writing Test.

Increased Academic Failure

Significantly higher percentages of 1989 examinees failed to obtain minimum and average scores required for passing, even after one or more retests. The number of those failing the tests increased by over

BEST COPY AVAILABLE

48 percent. The percentage of examinees taking retests did not change during the two years, but the failure rate for those taking retests in 1989 increased by 45.9 and 27.3 percent for examinees taking their first and second retests.

The effects of the increased score requirements on the failure rate of 1989 examinees were illustrated in Table 15 which analyzed the differential effects of different score requirements on the passing rates of 1986 and 1989 GED examinees and the 1987 Norming Sample. This analysis showed that if the 1989 examinees were held to the standards imposed in 1986, over 90 percent (an increase of 60 or 18.75 percent) of them would have obtained passing scores. Conversely, if the 1989 requirements had been applied in 1986 (even with a weaker GED test), then only 54.7 percent of them would have passed (a decrease of 139 examinees; or 34.24 percent) of those who took all five tests in 1986.

A Disincentive to Complete the Tests

The percentage of 1989 examinees who did not complete all five tests also increased by over fifty percent. Analysis of t-test comparisons of test scores for 1986 and 1989 Noncompleters, and comparisons of Noncompleters from both years to their counterparts who completed all five tests suggest that 1989 Noncompleters may have discontinued their examinations for "academic" reasons. This notion is particularly apparent in the fact that the 1986 Noncompleters' average score was above the 45 points needed for passing on four of the five tests, whereas the 1989 Noncompleters averaged two points below the 50 required for passing. Also, 1986 Completers significantly outperformed Noncompleters on three of the tests, but in 1989 Completers significantly outperformed Noncompleters on all tests. These observations suggest the increased score requirements served as a strong disincentive to complete the tests for those examinees who failed to obtain the average score on one or more tests.

Increased Participation in Postsecondary Education or Training

Those examinees who took the tests in 1989 were more likely to enroll in postsecondary education or training programs. When queried on the extent to which the GED was "helpful", they were more likely than 1986 examinees to indicate it was helpful for the purpose of entering college. Perhaps the 1989 examinees who met the higher standards imposed by the new score requirements had greater confidence in their abilities to perform in college and thereby perceived it as a more viable option than did the 1986 examinees.

Reduced Economic Benefits

As a group, the 1989 examinees earned significantly lower incomes and were significantly more likely to be unemployed than those who took the tests in 1986. However, those 1989 examinees who passed the GED tests were significantly more likely to be employed either full or part-time than those who failed. This observation suggests that economic benefits accrue more readily to examinees who obtain the GED as opposed to those who obtain higher scores on the tests, but fail to obtain a diploma.

Increased Score Differentiation With Increases in Minimum Scores

The analysis of the effects of minimum score requirements on the rates of passing individual tests for the 1986 and 1989 GED examinees and the 1987 Norming Sample (Tables 16 - 19) found that with each increase in the minimum score requirement, there were correspondingly greater increases in the variances between the lowest and highest scores on the five tests among the GED examinees. Whereas the Norming Sample also experienced some variance, it was relatively small in comparison. For example, with a minimum score of 50, only 40.3 percent of the 1989 examinees would pass the Writing Skills test, but 70.8 percent would pass the Science test: a difference of 30.5 points. Whereas a similar analysis found that the 1986 examinees had a variance of 16.5 points, the 1987 Norming Sample experienced a variance of only seven points.

This observation could be interpreted in one of two ways. One interpretations is that as cohorts, GED examinees differ substantially from the 1987 Norming Sample. The older and more experienced GED examinees differ considerably within their cohorts in terms of the number of years that have elapsed since they last attended high school, the academic skills that they might have "lost" due to non usage, and the academic skills they could have increased due to continuous usage. However, high school seniors that move through the curriculum as an age cohort, share similar academic experiences which are reflected in the cohesiveness of academic performances on the tests. This interpretation assumes the 1987 Norming Sample is representative of graduating seniors in Wisconsin and that the differences noted result from the "adult life" experience as opposed to the "youth academic" experience. A second interpretation is that the minimum variances in the scores of the Norming Sample is evidence that the sample was bias and does not represent the academic diversity that actually exists among Wisconsin's graduating seniors.

BEST COPY AVAILABLE

CONCLUSIONS AND RECOMMENDATIONS

This study suggests that the 1987 changes in GED score requirements significantly effected the academic preparation, performance, GED status, personal benefits, and social benefits of the 1989 GED examinees. Those high school noncompleters who desired the GED in 1989 apparently "tried harder" by pursuing more study options, and by studying the same number of hours per week as 1986 examinees, but studying for significantly more weeks. For those who succeeded, increased participation in postsecondary education and training and opportunities for either full or part-time employment were salient benefits. However, for a disproportionately high percentage of them this effort and commitment was in vain. Their "last gamble on education" resulted in failure and thereby exacted a high emotional toll in the form of either a "disincentive" for them to continue to take the tests, or the experience of repeated failure from retest efforts.

This significant failure rate appears to be related to the reduced economic benefits observed for the 1989 examinees as a group. Whereas, 1986 examinees with significantly more GED certificate holders, and the 1989 examinees who possessed the GED were more likely to be employed and to enjoy a significantly higher personal income, the 1989 examinees as a group tended to have significantly more unemployed and public assistance recipients. It is apparent that the GED certificate does make a difference in the lives of recipients, and when it is denied to examinees, both the potential recipient and the society-at-large suffer.

The mixed picture of positive and negative results of the changes in score requirements suggest that the experiment was not a total success, nor a total failure. The GED examinees did respond with increased academic efforts that did result in increased academic performance. Therefore, the following changes are recommended:

1. **The score requirements should be changed from a "minimum of 40 and an average of 50" to a "minimum of 40 and an average of 45.** This requirement would maintain the minimum scores of the present requirements, thereby demanding higher knowledge of examinees on all tests. However, it would lower the required average scores, thereby permitting greater access to the GED. Given the proposed requirements, only 66 percent of high school seniors nationally would pass compared to 79 percent of the 1987 Norming Sample, 84.7 percent of 1986 examinees and 88.4

percent of 1989 examinees. Currently, ten other states utilize this requirement, including Maryland, California, New York, Washington, and others.

2. **The results of the 1987 Norming Study should be disregarded as invalid and a new more representative study should be conducted.** The minimum variances of the scores of the 1987 norming sample compared to the variances observed for GED examinees again raise questions of the validity of the norming study. Also significant questions remain in regard to its representativeness of either ethnic minorities in the state or of those that take the GED tests. Nationally minorities are disproportionately represented among the populations of GED test examinees, and on other nationally normed achievement tests, e.g., the ACT, SAT, etc., they have had significantly lower test scores than non minority examinees. Therefore, minorities in the state of Wisconsin could be subjected to significantly inflated score requirements because they were underrepresented in the original norming sample.

3. **The administrators of GED test storage sites in the state of Wisconsin should adopt a common (uniform) set of data collection, storage and retrieval procedures.** The data gathering and data analysis processes for this study were obstructed because of non-standardized data maintenance procedures. Requiring a common recordkeeping procedure could assure greater ease of access to GED test data by researchers and evaluators in the future and provide more reliable data on policy issues and questions, such as the GED performance of minorities. Currently, some test sites collect data on the ethnicity of GED applicants and others do not.

4. **The process used to establish score requirements for the GED tests should be evaluated**. While the State Superintendent of Public Instruction has the authority to establish score requirements, the exact process used to make such an important decision which literally affects the dreams and economic welfare of thousands of Wisconsin citizens annually and the role of public discussion and debate on the issue remains shrouded in mystery.

5. **Further research should be conducted to address other significant questions and issues raised by this study**. Among them are the following:

BEST COPY AVAILABLE

a. To what extent do Wisconsin employers actually differentiate between high school noncompleters, GED recipients (either HSED or certificate holders), and high school diploma recipients?

b. To what extent are employers concerned about GED examinees' ability to meet more rigorous score requirements? Are employers more interested in examinees' abilities to demonstrate their competence in "passing" the tests?

c. To what extent were minority GED examinees disproportionately affected by the changes in 1987 GED score requirements?

d. What are the long-term personal, social, and economic benefits of the GED compared to the high school diploma, other alternative high school diplomas, and high school noncompletion?

e. What are the key factors involved in maintaining the credibility of the GED among employers and academicians at both two-year and four-year colleges?

References

Bulletin N0. 9017. The New Wisconsin High School Equivalency Diploma, Madison, WI: Wisconsin Department of Public Instruction, 1988.

Baldwin, J. "GED Candidates: A Decade of Change." GED Profiles: Adults in Transition. GED Testing Service of the American Council on Education, No. 1, September 1990.

Cervero, R.M. "A National Survey of GED Test Candidates: Preparation, Performance, and 18-month Outcomes." Adult Literacy and Basic Education. 1983, 7(1), 13-29.

DPI Bulletin No. 9017. The New Wisconsin High School Equivalency Diploma: Implementing PI5 of the Wisconsin Administrative Code. Wisconsin DPI, Bureau for Vocational Education, Madison, WI, 1988.

Kerlinger, F.N. Foundations of Behavioral Research, New York, N.Y.: Holt, Reinhart and Winston, Inc. 1973.

Kirk, R.E. Experimental Design: Procedures for the Behavioral Sciences, Belmont, CA: Brooks/Cole Publishing Co., 1968.

Laurence, J.H. Secondary Education Credentials: A Military Enlistment Policy Dilemma. Final Report 83-72, Prepared for Office of the Assistant Secretary of Defense. Alexandria, VA: Human Resources Research Organization, 1983.

Malizio, A.G. and Whitney, D.R. Who Takes the GED Tests? A National Survey of Spring 1980 Examinees. Washington, D.C.: American Council on Education, 1981.

Sonnenblick, C. "High School Equivalency Candidate Performance on the New York State High School Reading Competency Tests and on the GED Tests". GED Testing Service of the American Council on Education. American Council on Education GED Research Brief, No. 2, 1980.

Swartz, R. et al. The Official Teacher's Guide to the Tests of General Educational Development. GED Testing Service, The Center for Adult Learning and Educational Credentials. Washington, D.C.: American Council on Education, 1988.

The 1989 Statistical Report. Tests of General Educational Development, Washington, D.C.: American Council on Education, 1990.

The 1987 Wisconsin Norming of the Tests of General Educational Development. Madison, WI: Wisconsin Department of Public Instruction, 1988.

Webb, L. Relationship of the GED Tests to Skills Needed in the Workplace. Non published manuscript (Prepared for the GED Testing Service of the American Council on Education: Pelavin Associates, Inc.) 2030 M Street, N.W., Suite 800, Washington, D.C., 1991.

Whitney, D.R. "Summary Phase of the GED Testing Service Five-Year Review Process." Paper presented at the National Adult Education Conference, Philadelphia, Nov. 29--Dec. 4, 1983. (ED 239-090).

Whitney, D.R., and Others. The 1988 Tests of General Educational Development A Preview. Washington, D.C.: American Council on Education, 1985.

Whitney, D.R. "Performance of Adults on the New GED Tests". Paper presented at the National Adult Education Conference, Atlantic City, Oct. 1-7, 1989.

Wisconsin Legislative Audit Bureau. An Evaluation of High School Equivalency Program Requirements. State of Wisconsin, Madison, WI, 1991.

BEST COPY AVAILABLE

Appendix I

Cover Letter and Survey Instrument

BEST COPY AVAILABLE

UNIVERSITY OF WISCONSIN MILWAUKEE

Department of Administrative Leadership
School of Education

UWM

September 18, 1991

Dear :

Several weeks ago I wrote to you seeking your opinion on the relevance of the GED in providing increased opportunities for employment and education. As of today I have not yet received your completed questionnaire.

This research is being conducted for the State Board of Vocational Technical and Adult Education. The study examines the effects of the 1987 increases in score requirements for passing the GED test in Wisconsin. These increases are believed to be responsible for a sharp decrease in the numbers of examinees who take and pass the GED tests.

I am writing again because of the significance of each questionnaire to the usefulness of this study. Your name was drawn through a scientific sampling process in which everyone who took one or more of the GED tests in either 1986 or 1989 had an equal chance of being selected. This means that only about one of every 20 persons who took the tests are being asked to complete the questionnaire. In order for the results of this study to be truly representative of the opinions of all GED test examinees it is essential that each person in the sample return their questionnaire. As mentioned in my last letter, your responses will be treated confidentially. Survey results will be reported in groups of responses which will in no way identify individuals.

In the event that your questionnaire has been misplaced, a replacement is enclosed. Please return the completed questionnaire in the enclosed envelope by September 28, 1991. If you have any questions please contact me: (414) 229-5754 or at the address listed above.

Your cooperation is greatly appreciated.

If you have any complaints about your treatment as a participant in this study, please call or write:

Dr. Berri Forman, IRB Coordinator
Institutional Review Board for the Protection of Human Subjects
Lapham B-20; University of Wisconsin - Milwaukee
P.O. Box 413
Milwaukee, WI 53201 (414) 229-6016

Although Dr. Forman will ask your name, all complaints are kept in confidence.

I have received an explanation of the study and agree to participate. I understand that my participation in this study is strictly voluntary and that my responses are confidential.

_____ _____
Name Date

Sincerely,

Larry G. Martin (University of Wisconsin-Milwaukee)
Enderis Hall • PO Box 413 • Milwaukee, WI 53201

414 229-4740
FAX 414 229-4666

#_____

WISCONSIN GED SURVEY

Please take the time to complete this questionnaire. Your answers are totally confidential. No one will know your name. Please answer ALL questions COMPLETELY.

I. GED PARTICIPATION

A. There are many reasons for not completing high school. Which reason below **BEST** describes your reason for leaving high school before completion.

___ 1) High School was not challenging enough.
___ 2) Became employed.
___ 3) Became very sick.
___ 4) Poor grades in classes.
___ 5) Entered the military.
___ 6) Personal reasons.
___ 7) Became pregnant/married.
___ 9) Disagreements with teachers and administrators.
___ 10) Other (Specify)_____

B. Which of the following **BEST** describes your grades while you were in school?

___ 1) Mostly A (a numerical average of 90-100)
___ 2) About half A and half B (85-89)
___ 3) Mostly B (80-84)
___ 4) About half B and half C (75-79)
___ 5) Mostly C (70-74)
___ 6) About half C and half D (60-64)
___ 7) Mostly below D (below 60)

C. Were you encouraged by another person to become a GED participant?

___ 1) YES
___ 2) NO

If YES, which of the following **BEST** describes the role of the person who encouraged your GED participation?

___ 1) Spouse
___ 2) Family
___ 3) Friend(s)
___ 4) High School Teacher(s)
___ 5) Child (or Children)
___ 6) Counselor
___ 7) Employer
___ 8) Social Services Worker
___ 9) Judge
___ 10) Other (Specify _____

D. People take the GED tests for a number of reasons. Which of the following **BEST** describes your reason for taking the tests? (CHECK ONLY ONE)

___ 1) Obtaining a job.
___ 2) Keeping my job.
___ 3) Military entrance requirements.
___ 4) College entrance requirements.
___ 5) Technical School entrance requirements.
___ 6) Personal satisfaction.
___ 7) Other (Specify)_____

E. There are a variety of study options to help GED participants complete the program. Did you use any of the options listed in **F. 1 - 5 below**?

___ 1) YES (Please complete **Part F** below).

___ 2) NO (Please go to **Part H** below).

F. Please RATE on a scale of 1-4 the study options which were most helpful to you.

1=Not Helpful 2= Of Little Help 3=Somewhat Helpful 4=Most Helpful

___ 1) Had a personal tutor.
___ 2) Used GED video programs.
___ 3) Studied alone from a GED book.
___ 4) Took the official GED practice tests.
___ 5) Viewed GED instructional television.

G. For those items you rated 3 or 4, please explain how the options were helpful.

_____

_____

H. Did you study at a learning center or take classes to prepare for the GED test?

___ 1) YES (Please complete sections "I" and "J")
___ 2) NO (Please go to section "K")

I. Adults attending Adult Basic Education and GED classes sometimes face a variety of concerns. Please rate on a scale of 1-4 the extent to which the following statements describe your experiences in the adult basic education learning program.

1 = Strongly Disagree 2 = Disagree 3 = Agree 4 = Strongly Agree

___ 1) I am satisfied with the extent of my knowledge development in the program.
___ 2) My educational experience has had a positive influence on my interest in ideas.
___ 3) The instructors I had contact with were genuinely superior teachers.
___ 4) The instructors I had contact with were generally interested in students.
___ 5) While in the learning program I developed close personal relationships with other students.
___ 6) The student friendships I developed in the learning program have been personally satisfying.
___ 7) My non-classroom discussions with instructors were a positive influence on my personal growth.
___ 8) My non-classroom discussions with instructors were a positive influence on my career goals.

J. Please RATE on a scale of 1-4 how helpful the classes were in developing your academic skills.

1 = Not Helpful 2 = Of Little Help 3 = Somewhat Helpful 4 = Very Helpful

HOW HELPFUL WERE THE CLASSES FOR:

___ 1) Improving your reading skills?
___ 2) Improving your math skills?
___ 3) Improving your writing skills?
___ 4) Increasing your knowledge of science?
___ 5) Increasing your knowledge of social studies?
___ 6) Improving your test-taking skills?
___ 7) Increasing your self-confidence?
___ 8) Helping you prepare for further education?
___ 9) Helping you improve job-related skills?

K. About how many HOURS PER WEEK did you study for the GED ? **CHECK ONE**

___ 1) 2 hours or less per week.
___ 2) 3-6 hours per week.
3) 7-10 hours per week.
___ 4) 11-15 hours per week.
___ 5) 16 or more hours per week.

L. About how MANY WEEKS did it take you to prepare for the GED? **CHECK ONE**

___ 1) 4 weeks or less.
___ 2) 5-8 weeks.
___ 3) 9-16 weeks.
___ 4) 17-24 weeks.
___ 5) 25 or more weeks.

II. EMPLOYMENT INFORMATION

A. We are interested in learning about your employment record. Are you now the MAIN wage earner in your household?

___ YES
___ NO

B. When applying for a job, have you ever been told that a high school diploma or GED certificate were required for employment?

___ YES (PLEASE ANSWER #1 BELOW)
___ NO

___ 1. About how many times has this happened to you?

C. Which of the following **BEST** describes your CURRENT employment status? **CHECK ONE**

___ a) I WORK FULL-TIME (35 or more hours per week).
How many hours per week?_____

___ b) I WORK PART-TIME (less than 35 hours per week).
How many hours per week?_____

___ c) I AM UNEMPLOYED AND LOOKING FOR WORK.

___ d) I AM UNEMPLOYED AND NOT LOOKING FOR WORK.

1. Which of the above categories best describes your employment status BEFORE taking the GED?

___ a) EMPLOYMENT STATUS BEFORE TAKING THE GED.

D. If you checked "a" or "b" in Part C. , please answer the following questions:

1) What kind of work do you do?_____

2) How long have you done this type of work?_____

3) How much do you earn per hour?_____

E) **CHECK** which of the following income categories most closely estimates your personal income last year? (1990) **CHECK ONE**

___ a) 0 - $2, 999
___ b) $3,000 -- $4,999
___ c) $5,000 -- $7,999
___ d) $8,000 -- $10,999
___ e) $11,000 -- $13,999
___ f) $14,000 -- $16,999
___ g) $17,000 -- $19,999
___ h) $20,000 -- $22,999
___ i) $23,000 -- $25,999
___ j) $26,000 -- $28,999
___ k) $29,000 -- $31,999
___ l) Over $32,000

1. Which of the above income categories best describes your income BEFORE taking the GED test?

___ a) INCOME BEFORE TAKING THE GED.

2. Place a CHECK by any statement which is true. **CHECK ALL THAT APPLY**

___ a) I received public assistance (AFDC, General Ass't.) BEFORE taking the GED.
___ b) I received public assistance DURING GED preparation..
___ c) I received public assistance AFTER taking the GED.
___ d) I CURRENTLY receive public assistance.

3. What is your PRIMARY source of financial support? CHECK ONE

___ 1) Personal Employment
___ 2) Public Assistance (AFDC, General Assistance)
___ 3) Spouse
___ 4) Parent(s)
___ 5) Sibling(s) (Sister or Brother)
___ 6) Social Security (and/or SSI)
___ 7) Unemployment Compensation
___ 8) Charitable Organization(s)
___ 9) Other Please Specify

4. Please CHECK one statement that describes your income since taking the GED test:

___ a) My income INCREASED since I took the GED.
___ b) My income DECREASED since I took the GED.
___ c) My income HAS NOT CHANGED since I took the GED.

III. OTHER BENEFITS OF THE GED

A. Have you now PASSED the GED tests?

___ YES **(PLEASE GO TO PART "B")**

___ NO **(PLEASE GO TO PART "C")**

B. GED holders report a number of benefits from obtaining a GED certificate.

1) Using the following scale of 1-4 please rate how the GED certificate has actually helped you.

1 = Not Helpful 2 = Of Little Help 3 = Somewhat Helpful 4 = Very Helpful)

_____ a) Get a Job
_____ b) Keep a Job.
_____ c) Get a Promotion.
_____ d) Qualify For Entrance To A Two-Year College
_____ e) Qualify For Entrance To A Four-Year College.
_____ f) Other (Please Specify) _____

2) If you rated any of the above statements with a 3 or a 4, please DESCRIBE one of your experiences in which holding the GED was helpful.

_____

_____

3) After obtaining a GED, did you actually **enroll** in an educational or training program?

___ YES
___ NO

If **YES**, please check which **type** of program you are (or were) enrolled in:

_____ a) Two Year College
_____ b) Four College/University
_____ c) Technical/Vocational College
_____ d) Trade School
_____ e) Apprenticeship/On-The-Job Training
_____ f) Other (Please Specify)_____

4) Do you currently hold a GED certificate from Wisconsin?

___YES (PLEASE GO TO SECTION IV BELOW)
___NO (PLEASE ANSWER a, b, c, BELOW)

a) In what state did you receive the GED?_____

b) In what year did you receive the GED?_____

c) Did you take the GED tests in that state?

___ YES
___ NO (PLEASE ANSWER "d" BELOW)

d) Did you request that your Wisconsin test scores be sent to that state?

___ YES
___ NO

C. If you do not currently hold the GED, please explain briefly why.

_____

IV. DEMOGRAPHIC INFORMATION

A. What is your marital status?

___ 1) MARRIED
___ 2) DIVORCED
___ 3) WIDOWED
___ 4) SEPARATED
___ 5) SINGLE

B. What is your sex?

___1) MALE
___2) FEMALE

C. Please indicate your parents' highest level of educational attainment. (CHECK ONE FOR EACH PARENT)

Mother	Father	
___	___	1) Less than high school diploma.
___	___	2) High school diploma.
___	___	3) GED credentials.
___	___	4) Some years of college.
___	___	5) College degree.
___	___	6) Don't know.

D. Which of the following best describes your racial or ethnic identification?

___ 1) Black (African American)
___ 2) Hispanic
___ 3) Native American (American Indian)
___ 4) White (Caucasian)
___ 5) Asian
___ 6) Other Specify_____

Thank you for completing this important survey.

This information will help lawmakers, program administrators and teachers to improve the GED program in Wisconsin.